

DOCUMENT RESUME

ED 133 499

CE 009 356

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 TITLE Training for the Military.
 INSTITUTION Human Resources Research Organization, Alexandria, Va.
 REPORT NO HumRRO-PP-3-76
 PUB DATE Dec 76
 NOTE 16p.; Paper presented at a conference on social psychology of military service (University of Chicago, April, 1975)
 EDRS PRICE MF-\$0.83 HC-\$1.67 Plus Postage.
 DESCRIPTORS Educational Trends; *Instructional Programs; Military Personnel; *Military Training; *Skill Development; *Special Education; *Training Techniques

ABSTRACT

Descriptions of major categories of training, and methodology, techniques, status, and trends are presented in this discussion of military training. After noting the five categories of training--recruit, officer acquisition, specialized skill, flight, and professional development education--emphasis is placed on a discussion of recruit, or basic training, and specialized skill training. The section on recruit training covers the length of training, the goals, and a description of the various instructional programs. The specialized skill training section provides a general discussion of course length, changes in instructional approaches, and different areas of specialization. Concluding remarks point out that (1) all training is becoming subject to cost-effectiveness scrutiny, (2) the trend is toward performance-based job-oriented training that employs a variety of methods and media, and employs criterion-references testing, and (3) emphasis is on greater flexibility in training approach and training time, with a greater reliance on the individual both as learner and job performer. A bibliography is appended. (WL)

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Professional
Paper
3-76

HumRRO-PP-3-76

CE
HumRRO

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Paper presented at a Conference on
Social Psychology of Military Service,
University of Chicago April 1975

HUMAN RESOURCES RESEARCH ORGANIZATION
300 North Washington Street • Alexandria, Virginia 22314

December 1976

Prepared for
**Inter-University Seminar on the
Armed Forces and Society**
University of Chicago
Chicago, Illinois

U.S. DEPARTMENT OF HEALTH
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

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Published
December 1976
by

HUMAN RESOURCES RESEARCH ORGANIZATION
300 North Washington Street
Alexandria, Virginia 22314

TRAINING FOR THE MILITARY

Howard H. McFann

To try to describe military training in detail would require much more space than allotted in this book and, more importantly, much more time and knowledge than is available to the author. However, what can be done is to present selected information and trends. Such may possibly suffice, since there is always the danger of putting the reader in the position of stating that he now knows much more than he ever wanted to know about the topic. Where data are presented, every attempt has been made to be sure they are accurate; where opinions or generalizations are made, every attempt has been made to make them reasonable. This paper will encompass the scope of military training, present brief descriptions of the major categories of training, and comment on present methodology, techniques, status, and trends.

Training constitutes a major military activity during times of conflict and a primary military activity in peacetime. Training occurs in schools and in operational units. Almost all individual training occurs within schools and centers and has as its purpose the imparting of required skills and knowledges to individuals so that they are prepared for subsequent assignment as qualified members of operational military organizations.

In contrast, crew and unit training usually occurs in operational units, involves training for specific missions, and has the general purpose of maintaining and upgrading the operational readiness of the organization. For the most part, this chapter will deal with individual training which involves, predominantly, the training of military members in formal courses conducted by schools whose principal mission is training--not because such training is more important than operational training, but because it has been studied more, is easier to describe, and is a sufficiently large "bite" in itself.

Just how large is best described by stating that, for this fiscal year, the individual training and education costs for all Services will be in excess of six billion dollars and, in manpower terms, about one-sixth

of all military personnel are engaged in the training mission--as students and trainees, instructors and support personnel. It is estimated that in FY '75, this activity will involve some 341,000 persons. This training or education includes all formal military and technical training, professional education, and includes active force officers, enlisted personnel, Service academy personnel, reserve forces on active duty attending courses, and ROTC students.

These activities are organized into five major categories of training: Recruit Training, Officer Acquisition Training, Specialized Skill Training, Flight Training, and Professional Development Education. Approximately 85-percent of the student loads and dollars expended are accounted for by the three categories of Recruit, Specialized Skill, and Flight Training. It is on these three categories of training that the rest of my comments will focus.

Recruit or Basic Training

For all Services, enlisted members receive recruit or basic training as their introduction into the military. Recruit training, which varies in length from 6 to 11 weeks, depending upon the Service, has as its goal, in addition to processing individuals into the Service, the indoctrination of the individual into the Service and the imparting of "essential" skills and knowledges common to the Service. For FY '75, more than 325,000 young men and women will undergo this basic introductory and indoctrination training at an expenditure in excess of \$977-million. About 10-percent will not complete this phase of training, primarily for non-academic reasons.

The instructional approach employed by all Services is to organize the recruits into units and have them proceed through training in a single-track, group-paced mode. Those trainees who have difficulty are either recycled through part of the training, or provided remedial instruction. Remedial instruction common to all Services includes physical conditioning and basic literacy training. The content of recruit training for all Services is largely based upon tradition and expert judgment. There are

major differences in training methods and evaluation procedures employed by the Services. Both the Navy and Air Force train on academic subjects; e.g., First Aid, primarily by a lecture-demonstration-practice paradigm, and employ written and performance tests of a normative nature for evaluation. Also, both share an emphasis on developing general literacy as a goal of literacy remediation instruction.

In contrast, the Army has instituted a performance-based instructional program which employs criterion-referenced testing for evaluation. Specific objectives, with standards and conditions, have been delineated, and serve as the basis for both instruction and evaluation. Training is organized on the basis of six principles:

- (1) Performance-Based Instruction. Emphasis is on active skill practice rather than mere passive absorption of information.
- (2) Absolute Criterion. Every trainee is required to reach a standard of performance in each skill. Assessment is on a "go/no-go" basis rather than testing by written tests using a 70-percent normative criterion.
- (3) Functional Context. The trainee learns to perform in a job-relevant situation. Training is by performing and practicing tasks rather than by subject-matter acquisition.
- (4) Individualization. By practicing and performing a task to an absolute criterion, more leeway is given for the fast and slow learners.
- (5) Feedback. The instructor role is one of demonstrating skills, organizing skill practice, and checking out the trainees' performance at the training site rather than being primarily that of presenting information.
- (6) Quality Control. With performance-oriented training, trainees, instructors, and managers have a direct means of evaluation. Evaluation occurs at the end of each instructional period, a diagnostic evaluation test is administered half-way through the training cycle, and a comprehensive evaluation test is employed at the end of basic training.

Comparison tests of matched samples of trainees on this approach with the previous lecture-demonstration-practice approach employing a 70-percent normative criterion showed marked superiority, across all mental categories,

for personnel instructed by the performance-based approach.

Three principal events brought about this major innovation in "how to train." First, increased United States involvement in Viet Nam; second, increased pressure from minority and "disadvantaged" groups for governmental actions to improve the employability of large segments of the working population; and third, the decision to discontinue the draft and to rely on a volunteer force. The impact of the first two events on the Army was to increase its size, and a decision to lower the qualifications for entry. A major concern of movement toward an all-volunteer force was that the overall impact on the Army would be a reduction in quality of input. The then-existing instructional system, which relied to a considerable extent on verbal presentation and the use of written materials for both instruction and evaluation, was not very effective with lower-mental-ability personnel. Thus, research was initiated to investigate more efficient and effective ways of training the wide spectrum of personnel entering the Army, with special attention to those of lower ability.

The literacy remediation programs of all the Services were initiated primarily because of these same pressures. Further, the Army's existing program for literacy skill development grew out of the same research and development base that had fostered performance-oriented training. A multifaceted approach was taken--determination of the literacy requirements of jobs, determination of the reading ability of job incumbents and potential job incumbents, and development of a functional literacy program aimed at meeting job-reading demands.

The new program developed for the Army differs from its predecessor and from programs in the other Services in two major ways. First, it emphasizes job-functional literacy instead of general literacy and, second, it occurs at the end of basic training rather than before recruit training begins. The same principles employed in performance-based training are incorporated into this program.

In the future, I believe all of the Services will move toward recruit training programs that employ these principles.

For the Army, a large structural change will occur within the next few

years. Specifically, basic training will be integrated with advanced individual training, at least for combat re-entry job-producing programs. The reasons why are fairly straight forward: First, research has demonstrated that such integration produces a more highly qualified and motivated soldier in less time and at less cost; second, with a volunteer force all individuals come into the Army with a commitment to a particular career field; and third, there is pressure for the Army to become much more cost conscious in training time and to move the individual as rapidly as possible to operational units because of increased personnel costs, limited funds, and reduced authorized strength.

Consistent with the above, I believe, will be a job-oriented literacy program which is integrated with skill training and which is only the first step in a career-oriented literacy program. Such job-functional literacy programs will be common to all of the Services.

Specialized Skill Training

Specialized skill training provides officer and enlisted personnel with the skills and knowledge they need to perform specific jobs. It consists of two categories, initial skill training and skill progression training.

As implied, initial skill training is the formal institutional training usually given to enlisted personnel immediately after recruit training, and to new officers on their entry onto active duty. Its purpose is preparation for first job assignment.

Skill progression training is aimed at providing higher-level skills and imparting a broader base of knowledge for personnel about to assume positions of more advanced responsibility. In addition, especially for enlisted personnel, skill progression training provides formal instruction for the introduction of new equipment, and for refresher training.

About 95-percent of all enlisted personnel receive initial skill training immediately following recruit training. To meet requirements for the wide variety of skills needed by the four Services, the Army will this year conduct some 272 courses, the Navy, 134, the Air Force, 237, and the Marines some 210 courses, which includes courses provided by the Navy and the other

Services for attendance by Marines.

These courses, which vary markedly in complexity and subject matter, include such diverse skills as nuclear reactor specialist or electronic technicians to infantryman, cook, mechanic, and vehicle driver. As would be expected, course lengths vary widely from year-long courses such as the Army's nuclear power-plant operator's course to the Navy's 5 to 12 days for their Aviation fundamental course. The average course lengths in days for the Services are: Army, 63; Navy, 39; Marine Corps, 60; and Air Force, 100. Attrition rates, as course lengths, vary markedly from almost zero for the more routine courses to up to one-third for the highly technical courses, with the average attrition rate being in the 5-to-10 percent range. Of the 500,000 persons receiving such training this year, about 86-percent will be active duty personnel with the remaining 14-percent split about evenly between Reserve and National Guard enlisted persons.

The Enlisted skill progression training, though usually occurring later in the career pattern, also encompasses a wide variety of skills. The number of courses and average course lengths in days for the Services are: Army, 107 courses, 78 days; Navy, 2,384 courses, 85 days; Marine Corps, 130 courses, 72 days, and Air Force, 1,837 courses, 31 days. Attrition rates run from about 2-percent to 8-percent. Although some 85-percent of these specialized skill training courses have their counterparts in the civilian sector. A major difference is that the military not only trains, but employs directly the output of their instructional institutions. Such may well account for the interest in, and leadership provided by, the military in developing and utilizing the empirical systems approach to job definition and instructional content.

The application since the late sixties of systems-analysis techniques for determining training objectives and training content have had, and continue to have, a major impact on military training, especially in skill acquisition training. Careful analysis of a system into component jobs, job duties, tasks, and skill-and-knowledge requirements is becoming a common procedure, employed by all the Services. Training or instructional systems for all the Services in the future will be accomplished following the guidance

provided by Air Force Manual 50-2, entitled "Instructional System Development (ISD)." All new instructional systems will follow the ISD format and related existing systems will be revised, using this approach. Steps included in the ISD approach involve collecting and analyzing job data; stating training objectives; designing courses, to include content, method and media; course development; field testing; and implementation.

Although there are striking exceptions, and the trend is otherwise, most present instruction occurs within the conventional classroom structure in an instructor-centered, group-paced mode. Great use is made of traditional audio-visual media (films, audio tapes, slides, transparencies). Overhead projectors, 35mm slide projectors, and the like are as commonplace as chalkboards and flip-charts. Also, television continues to be widely used as a medium, not only for presenting technical material in a dynamic manner, but also for such uses as self-study and instructor self-confrontation training. Consistent with TV has been the increased use of video tapes, which permit economical and rapid production of instructional material and, with audio cassettes, allow for more individualized learning. Training aids such as cut-aways and working models of equipment have for years been extensively used for demonstration and explication. In summary, most instructors utilize a considerable array of instructional technology in their multi-media classroom.

There has been a gradual movement away from large-classroom instruction to small-group instruction, especially for the more technical, equipment-oriented courses. The introduction in the early sixties of Programmed Instruction (PI), and its rapid growth -- especially for technical training in the Air Force -- started the movement away from group-paced instruction and toward self-paced, if not individualized, instruction.

Although the growth rate of PI has leveled off, it still remains a dominant instructional approach and has opened the door for increased interest in self-paced instruction.

Integral to self-pacing have been the advances made in evaluating training or instruction. The emphasis on systems analysis and specification of objectives has been paralleled by a movement away from normative evaluation

by paper-and-pencil tests toward use of criterion-referenced evaluation employing situational and performance testing.

Development of criterion-referenced tests for measuring specified learning objectives has forced course development away from "time in training" (course length) toward "demonstrated mastery of material." Also, reductions in force size and increasing personnel costs associated with training have resulted in increased attention on possible cost savings during institutional training. There is an emphasis now on moving the individual soldier into an operating unit as soon as possible. The impact of instructional technology on technical training has awakened interest in individualized instruction and self-pacing. A substantial body of research findings exist that demonstrate savings of 25-to-30-percent in training time with no loss in proficiency -- and often increased proficiency -- result from using task analysis, performance-oriented training, accommodation of individual differences, and criterion-referenced testing. Until recently, administrative considerations have precluded widespread implementation of such programs. Primarily, the constraints have centered around problems of post-training assignments associated with variable student completion times. In addition, accommodation to individual differences has created some complicated management problems. As expected, computer utilization is alleviating these constraints. Though not yet in wide use, sufficient "test-beds," demonstrations and examples now exist to suggest that computer-managed instruction (CMI) will enjoy a growth rate similar to that programmed instruction enjoyed in the early sixties. Use of computer-assisted instruction (CAI) is somewhat sporadic at present, although with the research and development activities under way this approach promises to find much greater application in the next five years.

As discussed under recruit training, the major structural change in process for Army combat arms training (Infantry, Artillery, Armor, and Air Defense) consists of integrating basic and initial skill acquisition training (advanced individual training). For Army combat support training (e.g., Mechanics, Cooks, Clerical, Heavy Equipment Operators, etc.), major changes accomplished and under way have involved introducing performance-

oriented training and testing along with self-pacing. Consistently, performance based instruction for occupational training has been found to be very effective for all aptitude groups with the greatest benefit for the lower-ability person. A method of instruction that has proven quite effective is "peer instruction." The Army, especially in combat support training, has and is incorporating this approach into many initial skill developing courses, and the Air Force is presently integrating peer instruction in a revision of its communication specialist course. If judged successful there, then much wider application is planned.

Complex training devices and simulators have for years been a major part of the military's instructional technology arsenal, and with rising fuel and ammunition costs, their use for technical training is on the increase. The major difference is that simulation is becoming a primary instructional medium rather than an auxiliary one to supplement practice on operational equipment. This is especially so in pilot training and with other complex weapons systems such as Air Defense missile systems. For example, with introduction of a Synthetic Flight Training System (SFTS), the Army was able to reduce Helicopter Flight Instruction from 210 hours to 180 hours.

More and more, simulators are being used for skill acquisition, maintenance of performance, and evaluation of performance. Low-cost simulators have been found to be most effective for learning of practical-type tasks, while high-fidelity, high-cost simulators are being used for evaluation, and in lieu of operation of actual equipment. Integrated systems are being developed which combine training devices, low-fidelity simulation, high-fidelity simulation, and a marked reduction in operation of actual equipment. The use of digital computers for complex simulation (e.g., of aircraft) has become a reality. Various systems employing laser technology are being tested for use in weapon-system simulation. In the near future, lasers will be employed for acquiring and maintaining weapon firing skill and also for small-unit opposing-forces training. Thus, more realistic, free-play between opposing forces will be attainable, not only for training but for testing of tactics and weapon systems.

In quite a different vein, a major trend that is occurring within the Army is a personnel management system that is truly, integrated with the

training system. The Enlisted Personnel Management System (EPMS) under development is premised on career patterns resulting from job analyses which specify skill levels and performance-based Skill Qualification Tests (SQT). Thus the total system, operating from a job-oriented, performance-based framework which requires criterion-referenced testing, emphasizes promotion on demonstrated merit rather than primarily on longevity and subjective evaluation.

Officer training consistent with the changes at the enlisted level are scheduled revisions of officer basic and advanced courses. The Officer Basic Course will be focused on producing platoon leaders (i.e., job oriented), and will emphasize performance-oriented training. Also, the Officer Advanced Course will occur for officers after about four years' experience rather than the present eight years; and will focus on preparation for duties at the company commander level. Course content will include instructional technology such as computer-managed instruction, programmed instruction, and performance-oriented training. The goal is to prepare officers for their next assignment level, with full awareness that a majority will be operating as trainers or managers of training.

In addition, for all Services, much more training on organizational development is being given to officers and to senior NCO's, including such topics as performance counseling, management by objectives, and performance evaluation.

There is an awareness that with a volunteer force, leaders and managers must be better prepared to cope with personnel and to train and manage training, the primary activity of the military in peacetime. Further, with a reduced force and increased attention on costs, more effective and efficient training is coming to the fore as the recognized means for creating and maintaining an operational force.

In addition, there has recently been established an Interservice Training Review Panel which serves not only a coordination and information-exchange function on methods and media, but is also acting toward consolidation of courses across Services. Thus one Service will train all military heavy-equipment operators or Military Police. Just how far this consolidation will

go is impossible to conjecture at this time, but more will definitely occur in the future. Again, cost considerations seem to be driving the system for inter-Service training as well as intra-Service.

In summary, all training is becoming subject to cost-effectiveness scrutiny. The trend is toward performance-based job-oriented training that employs a variety of methods and media, and employs criterion-referenced testing. The emphasis is on greater flexibility in training approach and training time, with a greater reliance on the individual both as learner and job performer.

In conclusion, one observation on the rapidity of institutional change appears warranted. A colleague of mine observed that institutional change appears to occur under three conditions: by autocracy, by crisis, and by chance. At present, a little of each seems to be operating in the military training arena.

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